

WHAT IS CLAIMED IS:

- 1 1. A system for establishing vascular access over a guidewire, said
2 system comprising:
3 a dilator having a lumen sized to be introduced over a guidewire having a
4 pre-selected diameter; and
5 a radially expandable sleeve having a lumen therethrough and an
6 unexpanded diameter, said sleeve being configured to expand to a larger diameter as the
7 dilator is advanced through the lumen of the sleeve.
- 1 2. A system as in claim 1, wherein the dilator is tapered at one end to
2 facilitate advancement through the lumen of the radially expandable sleeve.
- 1 3. A system as in claim 2, wherein the dilator comprises an outer tube
2 and an inner obturator, wherein the obturator has the guidewire lumen and the tapered end
3 and wherein the obturator is removable from the outer tube so that the tube may be left in
4 place within the radially expandable sleeve after expansion.
- 1 4. A system as in claim 1, wherein the radially expandable sleeve has
2 a compliant or elastic structure so that its cross-section will collapse after expansion if the
3 dilator is withdrawn from the lumen of the sleeve.
- 1 5. A system as in claim 4, wherein the radially expandable sleeve
2 comprises a tubular braid.
- 1 6. A system as in claim 5, wherein the tubular braid is a mesh of non-
2 elastic filaments wherein radial expansion causes axial shortening of the braid.
- 1 7. A system as in claim 6, wherein the braid is embedded in or
2 covered by an elastic layer.
- 1 8. A system as in claim 1, wherein the radially expandable sleeve is
2 plastically deformable or has a locking structure so that it retains its expanded diameter
3 after the dilator is withdrawn from the lumen of the sleeve.
- 1 9. A system as in claim 1, wherein the radially expandable sleeve
2 comprises an anti-thrombotic coating.

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1 46. A kit as in claim 45, further comprising a dilator having a lumen
2 sized to be introduced over the guidewire.

1 47. A kit as in claim 46, further comprising the guidewire.

1 48. A kit as in claim 46, further comprising a sleeve introducer having
2 a tapered distal end and a lumen therethrough, said sleeve introduced being configured to
3 receive a guidewire through its lumen and to be received within the lumen of the sleeve,
4 whereby an assembly of the sleeve and sleeve introducer can be formed so that the
5 tapered end of the sleeve introducer can be advanced through the tissue to facilitate entry.

1 49. A kit as in claim 46, further comprising a needle.

1 50. A kit as in claim 46, further comprising a package wherein the
2 sleeve, dilator, and guidewire are contained in the package in a sterile condition.